

November 4, 2004

Mr. Karl W. Singer
Chief Nuclear Officer and
Executive Vice President
Tennessee Valley Authority
6A Lookout Place
1101 Market Street
Chattanooga, TN 37402-2801

SUBJECT: REQUEST FOR ADDITIONAL INFORMATION FOR THE REVIEW OF THE
BROWNS FERRY NUCLEAR PLANT, UNITS 1, 2 AND 3, LICENSE RENEWAL
APPLICATION (TAC NOS. MC1704, MC1705 AND MC1706)

Dear Mr. Singer:

By letter dated December 31, 2003, Tennessee Valley Authority (TVA) submitted an application pursuant to 10 CFR Part 54, to renew the operating licenses for the Browns Ferry Nuclear Plant, Units 1, 2 and 3, for review by the U.S. Nuclear Regulatory Commission (NRC). The NRC staff is reviewing the information contained in the license renewal application (LRA) and has identified areas where additional information is needed to complete the review. Specifically, the enclosed requests for additional information (RAIs) are related to Sections 3.1.2.4, B.2.1.13, and 4.7.8. Drafted forms of these RAIs were discussed with TVA staff on a telephone conference call on October 6, 2004.

Based on discussions with Ken Brune of your staff, a mutually agreeable date for your response to the RAIs is within 30 days from the date of this letter. If you have any questions regarding this letter or if circumstances result in your need to revise the response date, please contact me at (301) 415-1594 or by e-mail at yks@nrc.gov.

Sincerely,

/RA/

Yaira K. Diaz Sanabria, Project Manager
License Renewal Section A
License Renewal and Environmental Impacts Program
Division of Regulatory Improvement Programs
Office of Nuclear Reactor Regulation

Docket Nos. 50-259, 50-260 and 50-296

Enclosure: As stated

cc w/encl: See next page

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**BROWNS FERRY UNITS 1, 2, AND 3
LICENSE RENEWAL APPLICATION (LRA)
REQUEST FOR ADDITIONAL INFORMATION (RAI)
RELATED TO SECTIONS 3.1.2.4, B.2.1.13, AND 4.7.8**

Thermal Aging Embrittlement of Cast Austenitic Stainless Steel (CASS) Program

RAI B.2.1.13-1

The staff's position regarding screening criteria to determine susceptibility of components to thermal aging embrittlement of CASS is detailed in the letter dated May 19, 2000, from Christopher Grimes, Nuclear Regulatory Commission (NRC), to Douglas Walters, Nuclear Energy Institute (NEI). The licensee states that the only in-scope CASS components that were determined to be susceptible to thermal aging embrittlement are the main steam line flow restricting venturis. The following information is requested.

- (a) Please provide the material specification including material grade, chemical content, casting method (i.e. either static or centrifugal), percent ferrite (using Hull's equation factors or a method producing an equivalent level of accuracy) and operating temperature for the flow restricting venturis.
- (a) Have the flow restricting venturis been evaluated in accordance with the guidance detailed in the May 19, 2000, NRC letter?
- (b) Are the components considered potentially susceptible to thermal aging embrittlement when screened using the criteria outlined in the May 19, 2000, NRC letter?

Emergency Equipment Cooling Water (EECW) Weld Flaw Evaluation

RAI 4.7.8-1

The applicant states that analysis was performed on 17 EECW system piping welds that have flaws larger than what is normally considered acceptable. Please discuss the circumstances under which these flaws were discovered and provide a list and description of each of the 17 welds in question including the code class, flaw inspection history, flaw sizes and a detailed description of any analysis including the method that was used to determine flaw growth.

Reactor Recirculation System Aging Management Evaluation

RAI 3.1.2.4-3

In Table 3.1.2.4 Page 3.1-54 (on CD ROM version of LRA) lists a copper alloy material used in heat exchangers operating in a raw water (internal) environment. The aging effects are listed as loss of material due to biofouling, microbiologically induced corrosion (MIC), crevice and pitting corrosion. The applicant lists the AMP as the One-Time Inspection Program (B.2.1.29). The table item shows that neither the component or the material and environment combination is evaluated in NUREG-1801. The table notes indicate that the aging effects identified for this material/environment combination are consistent with industry guidance.

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- (a) Identify the heat exchangers involved and the type of copper alloy (including material specification). Discuss the age, operating history, and inspection history of the heat exchangers. Discuss the consequence of leakage in the heat exchangers. Based on the operating and inspection history, explain why periodic inspections are not necessary during the extended license period.
- (b) Discuss in detail the extent of the planned One-Time inspection and explain why a One-Time inspection will be adequate to detect early stages of degradation that may effect the reliable operation of the heat exchanger through the extended licensing period.

RAI 3.1.2.4-4

In Table 3.1.2.4 Page 3.1-55 lists copper alloy piping operating in a treated water (internal) environment. NUREG-1801 Vol. 2 Item VII.C2.1-a. The aging effects are listed as loss of material due to crevice and pitting corrosion. The applicant lists the AMP as the One-Time Inspection Program (B.2.1.29). Table 3.1.2.4 notes show that the material is not listed in NUREG-1801 for this component. The table notes indicate that the aging effects identified for this material/environment combination are consistent with industry guidance.

Discuss the age, operating history and inspection history of the aforementioned copper alloy piping. Discuss the consequence of leakage of this piping. Discuss in detail the extent of the planned One-Time inspection and explain why a One-Time inspection will be adequate to detect early stages of degradation that may effect the reliable operation of these components through the extended licensing period. In addition, please provide the material specification of the piping.

RAI 3.1.2.4-5

In Table 3.1.2.4 Page 3.1-62 lists stainless steel valves operating in a treated water (internal) environment. The table notes show that the aging effect in NUREG-1801 (V.C.1-b) for this component, material and environment combination is not applicable. The table notes also indicate that based on the system design and operating history, MIC and biofouling are not applicable to the treated water portions of this system.

Discuss the age, operating history, and inspection history of the valves. Provide a detailed explanation of the attributes of the system design that make degradation due to MIC and biofouling not applicable.

RAI 3.1.2.4-6

In Table 3.1.2.4 identifies a One-Time inspection specified in B.2.1.29 as a part of the Aging Management Program (AMP). According to B.2.1.29 a One-Time inspection is applicable for piping and fittings with diameter less than 4 inch nominal pipe size (NPS). Identify whether the reactor recirculation system has previously experienced cracking due to stress corrosion cracking (SCC), intergranular stress corrosion cracking (IGSCC) or cyclic loading, and the extent of cracking. If cracking has occurred, identify whether the cracking was in piping less than 4 inch NPS and/or over 4 inch NPS. Identify the method of the One-Time inspection. The LRA does not address the type and frequency of the inspection requirements as a part of the AMP, for piping greater than 4 inch NPS. Identify the AMP used for piping greater than 4 inch NPS.

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- 2 - **BROWNS FERRY NUCLEAR PLANT**

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